

- a) defining a display extent on the display surface within which extent the image is to be displayed;
- b) defining a 3-D space and a viewpoint in the 3-D space;
- c) accepting user input to determine an extent and a position of a focus panel in the 3-D space wherein said focus panel is a panel positioned within boundaries of a representation of the display surface;
- d) calculating a transform matrix for each of said focus panel, four edge panels and four corner panels, wherein an edge panel is a rectangle in the 3-D space with one edge coincident with the focus panel and an opposite edge coincident with an edge of the display extent and wherein a corner panel is a parallelogram in the 3-D space with two adjacent edges coincident with edges of two edge panels, thereby forming a continuous, nine-panel surface in the 3-D space with a transformation matrix for a panel defining a mapping of points on the image to points on the nine-panel surface;
 - wherein calculating the transform matrix for each of said four corner panels comprises the steps of:
 - (1) calculating a shearing transform of a corner panel from a rectangle to a quadrilateral, said shearing transform resulting in an angle between side edges of said corner panel equal to a fitting angle for said quadrilateral, wherein said fitting angle is an angle formed by edges of the two side panels adjacent to the corner panel for which the shearing transform is calculated; and
 - (2) calculating a rotation transform of the quadrilateral in said layout plane, the rotation transform being a transform of a rotation by a rotation angle which would rotate the quadrilateral into alignment with the two side panels;
- e) rendering a display image of the continuous, nine-panel surface from the viewpoint using the transformation matrices calculated in step d), the step of rendering using as its input a plurality of object representations providing the context and detail information; and
- f) repeating at least steps c), d) and e) in real-time to provide interactive navigation of the image by a user inputting the user input.

2. The method of claim 1, wherein said plurality of object representations are text characters, lines of characters, and pages of lines, and the image is a document.

3. The method of claim 1, wherein the plurality of object representations are nodes and lines, and the image is a map.

4. The method of claim 1, wherein a prerendering resolution of objects represented in said side panels is lower than a prerendering resolution of objects represented in said focus panel.

5. The method of claim 4, wherein the image is a text document and said lower resolution is provided by using greeked text for text in said side panels.

6. The method of claim 1, said step of rendering a display image comprises steps of:

identifying which object representations are visible on which panels; and

rendering object representations for particular panels, eliminating object representations in any particular panel rendering where an object representation is wholly unrepresented in the particular panel.

7. The method of claim 1, further comprising the steps of: accepting movement commands;

repositioning said viewpoint and said extent in said 3-D space according to said movement commands;

adjusting said transforms as necessary to keep said side panels in view from said viewpoint; and

rerendering said focus panel, side panels and corner panels based on said adjusted transforms and said repositioned extent.

8. The method of claim 7, wherein said step of rerendering is timed to be completed in a constant time.

9. The method of claim 7, wherein said step of rerendering is timed to be completed in a time proportional to a distance on a full image between positions of said full image relative to said focus panel before and after said step of repositioning.

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